SciDAC Program Overview

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SciDAC Outreach Center

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SciDAC: High Level

- Core ideas
  - Modeling and simulation can advance scientific understanding
  - Collaboration is built in over 5 year periods
  - All Office of Science programs participate
- Key: Applied math, CS, and physical sciences make proposals that call out specific collaborations
- Structure: Institutes and Centers for Enabling Technology drive Scientific Application Partnerships
- Office of Science and NNSA funded

http://www.scidac.gov

SciDAC-2 Drivers

- Simulation at Scale
  - Application frameworks
  - Advanced solvers, meshing
  - Scalable performance tools
- Data and Storage
  - Visualization / analytics
  - Data management, filesystems
- Are these your drivers?
  - Y : Let's discuss particulars
  - N : What did we miss?

SciDAC-2 Outreach: Motivation

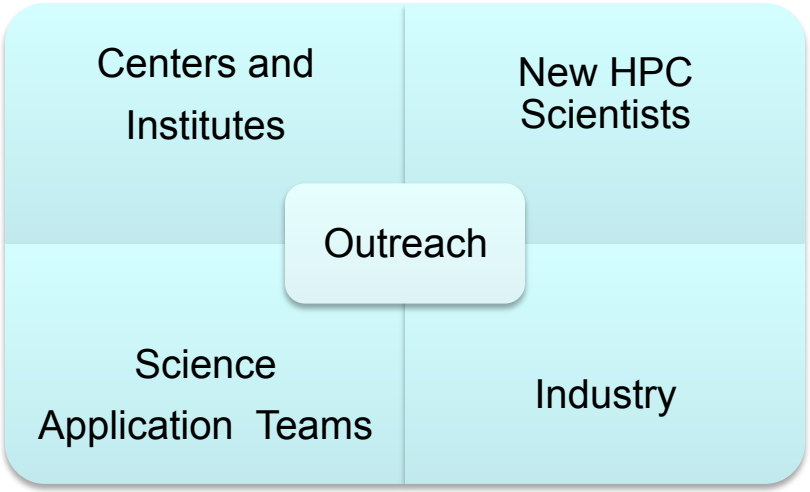
A SciDAC program that looks within as well as to broader communities will find:

- **better solutions for existing stakeholders**
- **new partners for SciDAC-2 (3…)**
- **new HPC talent, new grand challenges**
- **new supporters of DOE software**

Outreach is Bidirectional

- **Bring new audiences to SciDAC**
  - Tutorials, guest accounts, HPC startup
  - Targeted trainings, answer questions
- **Bring SciDAC to new audiences**
  - Make software easy to download and use
  - Tools for development, improving SW

Methods for Outreach



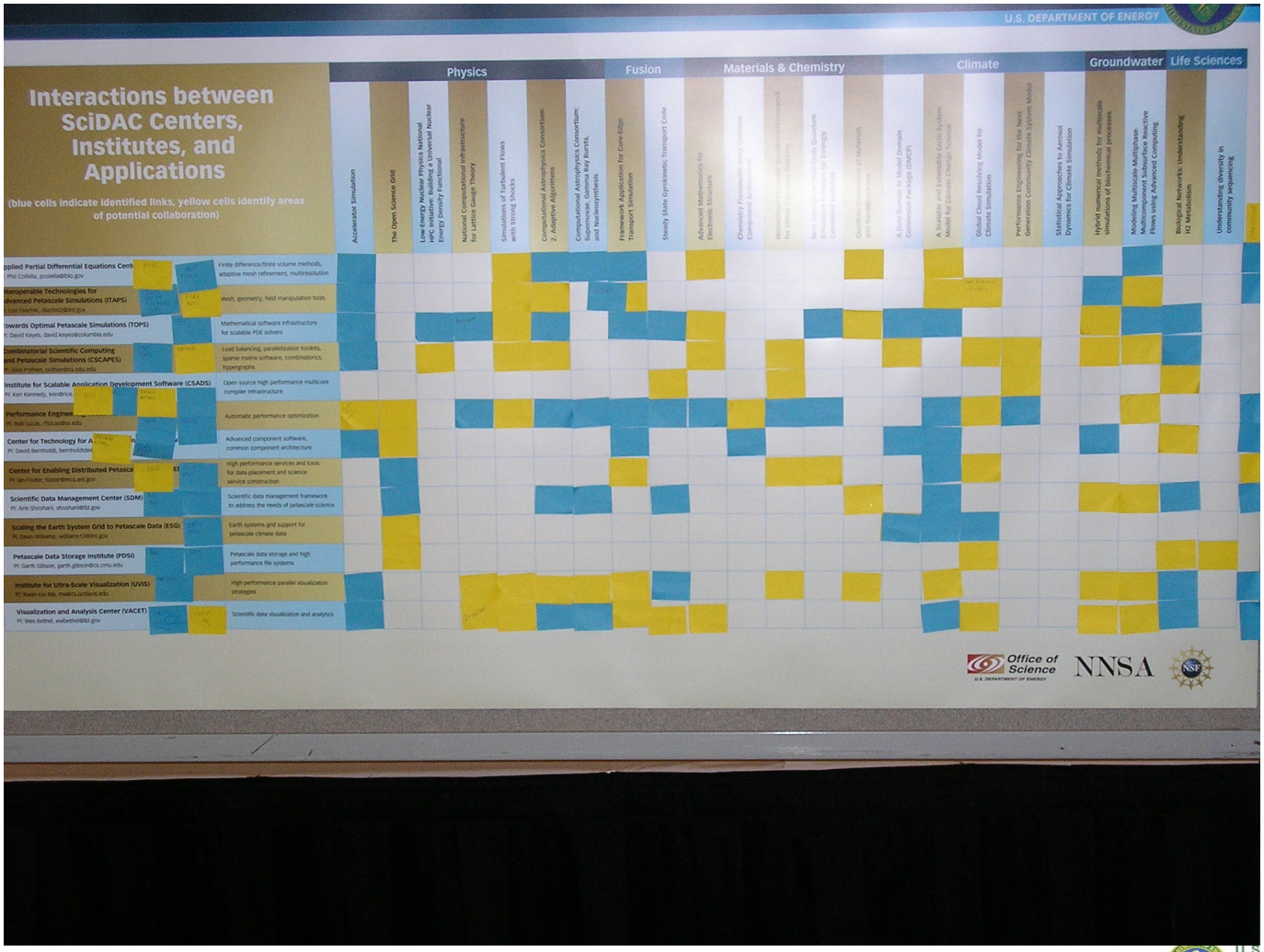
"Bring people together by finding resources to meet their disparate and shared needs in HPC"

- Tutorials, in-person meetings
- Finding SciDAC software solutions
- Scaling studies on DOE machines

Method: Getting people together

- Initial SciDAC-wide meetings of SciDAC PIs
  - Atlanta Feb 5-6 2006 (SciDAC Kickoff)
  - Las Vegas Nov 20-21 2007 (C&I Planning)
- Subsequent Point-to-Point meetings
  - Telecons "Bob meet Alice"
  - Travel stipends "Bob go talk at Alice's Workshop"
- In both cases we listen, track needs, and follow-up
- Annual SciDAC Tutorials Day

Post-it Collaboration Map



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Collaborations between Centers, Institutes, SAPs by science area

●= existing ●=potential	Physics	Fusion	Mat. Sci & Chemistry	Climate	Ground Water	Life Sciences
APDEC	●●●●	●	●●	●	●	
ITAPS	●●●	●●		●●	●●	
TASCS	●●	●	●	●●	●	●
TOPS	●●●●●	●●	●●●	●●	●●	●
CEDS	●	●	●●	●●		
CSADS		●	●	●		●
ESG	●			●●●		
SDM	●●●	●	●	●	●●	●
VACET	●●●●●	●●	●	●●	●●	●
UVIS	●●●●●	●●	●●	●	●●	●
CSCAPES	●●●●		●●	●●●	●●	●
PDSI	●			●		●●
PERI	●●●●●●	●●	●●●●	●●●	●	

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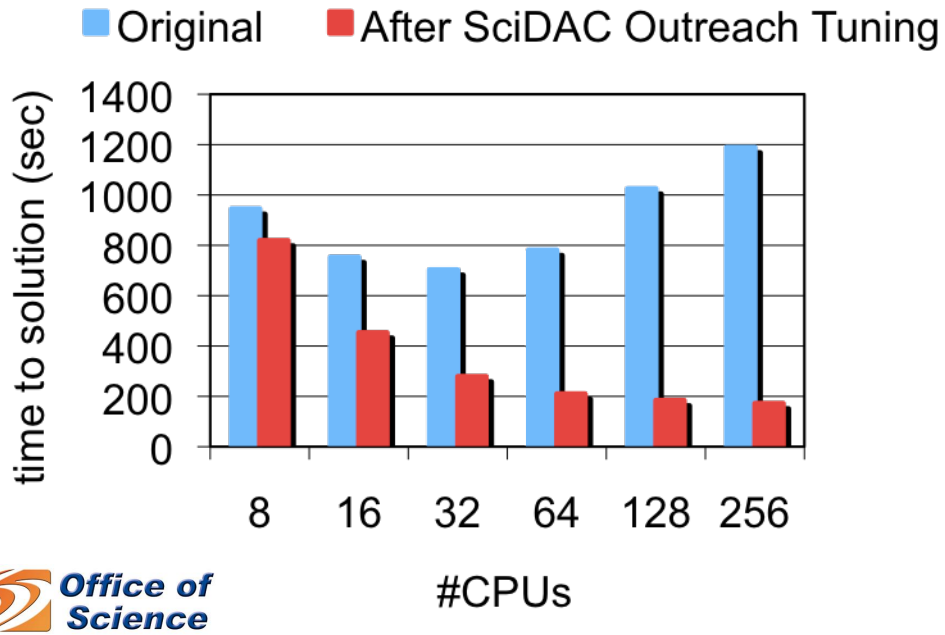
Method: HPC Experience

- SciDAC is uniquely positioned to provide rapid assessment of HPC application needs through choices of software and hardware
- Allows for scalable intake of new HPC apps to determine
  - Overall performance
  - Software/algorithm suitability
  - Bottlenecks to scalability
  - Appropriate HPC system selection

Case Study: United Technologies Corp.

- **AMR based spray combustion code needed improved scalability to tackle larger problems in improving fuel efficiency**
- **SciDAC Outreach methods for Industry**
  - **Identify computing needs in industrial areas that reinforce the DOE mission**
  - **Offer short-term help: code profiling, HPC scalability, tuning, tutorials**
  - **Foster long-term collaborations, Communicate the SciDAC mission**



- UTC: explained their goals
- Outreach: profiling, tuning
- 3.6x faster time to solution
- Everyone wins (UTC, DOE, HPC)

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SciDAC is Science, People, and Code

- Join us
  - At SciDAC tutorials day Denver, July 15
  - Online at outreach.scidac.gov
  - At an ACTS workshop, August 2011
- Send us feedback or ideas
  - Today at this meeting
  - By email, help@outreach.scidac.gov
- Keep informed
  - SciDAC Review Journal
  - On LinkedIn hosted SciDAC group

Thank You

We are interested in your thoughts and inquiries about what will make SciDAC-3 wildly successful.

Please contact us with your questions or feedback.

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